

REMARKS

Claims 1-26 are pending in the present application.

The present invention provides, in part, a bending apparatus for bending at least one glass sheet placed on a bending mold into a desired shape by heating in a furnace, which comprises a bending mold for placing at least one glass sheet thereon, a tunnel-like heating furnace through which the bending mold is conveyed, a first group of a plurality of heating elements fixed on an inner wall of the heating furnace, and a radiation-heating device having a second group of a plurality of heating elements placed separably from the inner wall surface of the heating furnace,

wherein said second group of a plurality of heating elements of said radiation-heating device are mounted on a *heater rack* that may be moved to increase or decrease the distance between said second group of a plurality of heating elements and said glass sheet, wherein said second group of a plurality of heating elements comprises five or more heating elements, and

wherein the temperature of each heating element of said second group of a plurality of heating elements may be individually controlled (Claim 1).

Applicants submit that GB 836,560 (GB '560), individually or combined with Kamata, does not affect the patentability of the same for the following reasons.

The rejections of: (a) Claims 1-4, 11, 12, 17, and 24 under 35 U.S.C. §102(b) over GB 836560 (hereinafter “GB ‘560”); (b) Claims 1-4, 11, 12, 17, and 23 under 35 U.S.C. §103(a) over GB ‘560, and (c) Claims 5, 13, 18, and 21 under 35 U.S.C. §103(a) over GB ‘560 in view of Kamata, are respectfully traversed.

Applicants again submit that GB ‘560 fails to disclose or suggest that the second group of a plurality of heating elements that are mounted upon a heater rack are five or more.

In the outstanding Office Action the Examiner continued to maintain his position that the claimed invention reads on GB ‘560. It appears that this position is based, in part, on the disclosure at page 3, lines 79-85 of GB ‘560. However, the Examiner also pointed to Figure 3 of GB ‘560 as providing support for multiple crease heaters 88 being mounted upon a single axle rod 96.

Figure 3 of GB ‘560 does appear to provide support for a *single pair* of crease heaters 88 being mounted on an axle rod 96. In referring to the axle rod, it appears that the Examiner is interpreting the axle rod as being a heater rack, which Applicants are willing to accept for the sake of argument. However, even if Figure 3 of GB ‘560 does disclose crease heaters mounted on an axle rod, this still would not meet the heater rack limitation of the claimed invention where the second group of a plurality of heating elements is mounted on a heater rack such that the plurality is five or more. Specifically, Figure 3 is merely a two-dimensional cross-section view of the bending lehr. The Examiner attention is directed to the bending lehr of GB ‘560 illustrated in Figure 10 in which many pairs of crease heaters 88 are arranged throughout the bending lehr where each single pair of crease heaters 88 is mounted on an axle rod. Therefore, the apparatus of GB ‘560 would require an axle rod 96 for each pair of crease heaters 88. As such, the crease heaters 88 cited by the Examiner as being the

claimed "second group of a plurality heating elements," are mounted on *many* individual axle rods, which is certainly not the same as a heater rack.

In contrast, the presently claimed invention defines the minimum number of heating elements mounted on the heater rack as being "5 or more heating elements." (see Claims 1 and 6). Even if the Examiner's interpretation of an axle rod as being a heater rack is correct, Applicants submit that the disclosure at page 3, lines 79-85 of GB '560, as well as Figures 3 and 10 only support mounting of two crease heaters upon the axle rod. At no point does GB '560 disclose or suggest that the axle rod would support any more than two crease heaters. As such, Applicants submit that the present invention is not anticipated by or obvious in view of the disclosure of GB '560.

Despite the foregoing, the Examiner asserts that "the support housing is deemed as the claimed 'heater rack' since it meets the claimed function of having a plurality of heaters mounted thereon", but the "support housing" of GB '560 is completely different from the "heater rack" of the present invention in the construction and the functions. The "support housing" itself does not move up and down, and the "heaters 88 are raised and lowered" by rotation of the axle rod 96 as evident from Figures 7 and 9, as well as from the description "rotating the axle rod 96 raises or lowers the support wires 90 and 91 thereby *adjusting* the vertical position of the crease heaters 88 within the lehr" (page 3, left column, lines 39-42 of GB '560). In GB '560, there is simply no description or suggestion that "the axle rod is moved in the direction perpendicular to the movement of the glass sheet". On the other hand, in the present invention, "the second of plurality of heaters" are moved up and down by up/down movement of the physical structure of the "heater rack".

Further, in the "support housing" of GB '560, the heaters 88 can only be placed linearly along the axle rod 96, but in the "heater rack" of the present invention, heaters can be arranged two -dimensionally and the distance from the two dimensionally arranged heaters and a glass sheet can be changed at the same time. In order to position a plurality of heaters at the same areas, in the construction of GB '560, a large number of axle rods 96 need to be disposed and complicated operation control is required, but in the present invention, only a single "heater rack" is required for each area to be moved at the same time, and thus, the overall structure can be greatly simplified.

In view of the foregoing, the present invention and GB '560 are completely different in regard to structure and function.

The Examiner also asserts that GB '560 discloses providing heaters 88 in areas where the severe bend of the glass sheet is needed, and asserts that it is easily conceivable for a person skilled in the art to increase the number of heaters according to the shape of the glass sheet. However, this point is actually significant to difference between the disclosure of the GB '560 and the concept of the present invention.

According to GB '560, the heaters are provided in areas where the sheet is to be severely bended, which means it is sufficient to arrange the heaters locally and *linearly* along "the axle rod". However by such a construction, only a glass sheet having a pan bottom shape as shown in Figure 3 can be formed, but a smoothly and deeply curved shape cannot be formed. In the present invention, multiple heaters are two-dimensionally arranged upon the same heater rack (e.g., heaters may be arranged along a curve to provide an appropriate temperature distribution), whereby it is possible to form a shape smoothly and deeply curving. For this purpose, a heater rack structure capable of disposing a group of heaters and moving

them closer to a glass sheet at the same time, is required. The claimed construction is unequivocally distinct from that described in GB '560.

Further, it is not possible for the skilled artisan to modify the disclosure of GB '560 to arrive at the present invention without either a suggestion to do so in this reference or a stroke of creative genius. It is well settled that whether the claimed invention is within the capabilities of one of ordinary skill in the art is not sufficient by itself to establish *prima facie* obviousness (MPEP §2143.01). To establish *prima facie* obviousness there must also be some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art (MPEP §2143.01). There being no motivation to modify the disclosure of GB '560 in the reference itself or any other cited reference, much less established to be available in the knowledge generally available, the present invention can only be arrived at by a stroke of creative genius... that of the present inventors. As such, the present inventors should be rewarded for their discovery and the rejections over GB '560 should be withdrawn.

Kamata is cited as disclosing "heating elements having a heating plate have heater wires." However, Kamata does not compensate for the aforementioned deficiencies in the disclosure of GB '560. Specifically, Kamata is also silent with respect to a *second* group of a plurality of heating elements that are mounted on a heater rack, much less the number of the same.

For the foregoing reasons, Applicants submit that the claimed invention is not obvious in view of GB '560, individually or combined with Kamata. Acknowledgement that these grounds of rejection have been withdrawn is requested.

Finally, Applicants remind the Examiner that MPEP §821.04 states:

...if applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims which depend from or otherwise include all the limitations of the allowable product claim *will* be rejoined. (*emphasis added*)

Upon a finding of allowability of the elected product claims, Applicants respectfully request rejoinder of the withdrawn process claims.

Applicants submit that the present application is now in condition for allowance.

Early notification of such action is earnestly solicited.

Respectfully submitted,

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